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# Municipal Broadband: Challenges and Perspectives

Craig Dingwall

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# Municipal Broadband: Challenges and Perspectives

**Craig Dingwall\***

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## I. INTRODUCTION AND SUMMARY

Over 50 million Americans have broadband,<sup>1</sup> which trails “only CD players as the fastest consumer technology that has reached mass-market popularity.”<sup>2</sup> Over 19 million American broadband subscribers access the Internet over Digital Subscriber Line (“DSL”), and over 25 million have cable modem access.<sup>3</sup> Fixed and mobile wireless, satellite Internet, and Fiber to the Home (“FTTH”) make up the difference, with over 4 million subscribers across those technologies.<sup>4</sup> Yet the United States ranks twelfth among all Organisation for Economic Co-Operation and Development (“OECD”) countries in broadband penetration per 100 inhabitants<sup>5</sup> and sixteenth worldwide in broadband service penetration.<sup>6</sup> Although broadband penetration rates are growing substantially in the United States, broadband penetration rates are below those in Denmark, Korea, and other countries.<sup>7</sup>

President Bush “has called for ‘universal, affordable access for broadband technology by the year 2007,’” and broadband deployment is FCC Chairman Kevin Martin’s “highest priority.”<sup>8</sup> Congress directed the

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1. FCC INDUSTRY ANALYSIS AND TECHNOLOGY DIVISION, WIRELINE COMPETITION BUREAU, HIGH SPEED SERVICES FOR INTERNET ACCESS: STATUS AS OF DECEMBER 31, 2005, Table 1 (2006), [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-266596A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-266596A1.pdf) [hereinafter HIGH SPEED SERVICES FOR INTERNET ACCESS]. See also Glenn Fleishman, *Stat of the Day: 41.2M Broadband Subscribers*, WI-FI NET NEWS, Mar. 9, 2006, <http://wifinetnews.com/archives/006358.html>. For purposes of this Article, broadband means higher than 200 kilobits per second (kbps) in at least one direction. Kilobits are commonly used to express digital communication speeds. 1 kilobit=1000 bits.

2. Tara Howard, *Incumbents and Lobbyists Protest as Municipalities Attempt to Bridge the Divide*, YANKEE GROUP, Aug. 26, 2005, at 1.

3. HIGH SPEED SERVICES FOR INTERNET ACCESS, *supra* note 1, at Table 1. See also Fleishman, *supra* note 1.

4. HIGH SPEED SERVICES FOR INTERNET ACCESS, *supra* note 1, at Table 1.

5. Enid Burns, *Broadband Grew 33 Percent Years' Time*, ClickZ Stats Broadband, Oct. 17, 2006, <http://www.clickz.com/showPage.html?page=3623713> (showing that as of June 2006, the United States ranked twelfth worldwide among OECD countries with 56,502,351 total broadband subscribers and had 19.2 subscribers per 100 inhabitants, trailing Denmark, Netherlands, Iceland, Korea, Switzerland, Finland, Norway, Sweden, Canada, the United Kingdom and Belgium.).

6. Brian Hammond, *Tech Officials Back Senate Bill to Increase Research Funding*, TR DAILY, Mar. 15, 2006 (on file with the *Federal Communications Law Journal*). Compare U.S. Still 15th in Broadband Penetration, CEA Says, TELECOM A.M., Mar. 31, 2006 (according to the Consumer Electronic Association, the U.S. ranks fifteenth in the world in high-speed Internet penetration).

7. Reed E. Hundt & Gregory L. Rosston, *Communications Policy for 2006 and Beyond*, 58 FED. COMM. L.J. 1, 3 (2006) (citing Thomas Bleha, *Down to the Wire*, FOREIGN AFF., May/June 2005, at 111, 112). See also Robert McChesney & John Podesta, *Let There Be Wi-Fi*, WASH. MONTHLY, Jan./Feb. 2006, at 14. See Burns, *supra* note 5.

8. McChesney & Podesta, *supra* note 7, at 15.

FCC and the states to encourage the deployment of advanced telecommunications capability, including broadband, on a reasonable and timely basis.<sup>9</sup> Clearly we need policies that encourage responsible broadband deployment in the United States.

Faced with the lag in broadband penetration in the United States relative to many other countries, it is not surprising that hundreds of government-sponsored broadband projects have been deployed or are under development in this country. Cities across the country are offering low-priced broadband access because it is not available or it is too costly in their area. Municipal broadband can, however, come at a high cost to the municipalities' ratepayers, create a glut of facilities if supply exceeds demand, and present difficult challenges for the industry and regulators. This article reviews the status and challenges of municipal broadband and provides recommendations for responsible broadband deployment.

## II. BROADBAND DEMAND

Many municipalities, telecommunications companies, and cable companies are vying to offer the elusive quadruple play of telephone, video, Internet, and wireless services. Broadband is a critical component of this package, as our society evolves from an analog to a digital world where bits of data are transferred over various applications to provide video, voice, and data services.

High-speed Internet access, or simply broadband, allows users to reach the Internet at higher speeds than they could with traditional modems. Broadband works by using data processing capabilities that compress voice, video, and data information into bits that become words, pictures, charts, graphs, or other images on computer, wireless phones, or screens.<sup>10</sup> High-speed Internet access advantages include "always-on" access to the Internet, information downloads at significantly higher speeds than traditional modems, online access without tying up telephone lines, videoconferencing, employee telecommuting, and access to entertainment resources.<sup>11</sup>

Several high-speed transmission technologies are available, including DSL, cable modem, wireless access, satellite access, FTTH, and power line broadband. DSL is a wireline transmission technology that brings data and information faster over copper telephone lines already installed in homes

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9. Telecommunications Act of 1996, Pub. L. No. 104-104 § 706, 110 Stat. 153 (codified as amended at 47 U.S.C. § 157 (2000)).

10. FCC CONSUMER & GOVERNMENT AFFAIRS BUREAU, HIGH SPEED INTERNET ACCESS – "BROADBAND" (2006) (on file with the *Federal Communications Law Journal*) [hereinafter HIGH SPEED INTERNET ACCESS].

11. *Id.*

and businesses.<sup>12</sup> A DSL modem accesses the local telephone company's central office where a DSL Access Multiplexer ("DSLAM") transmits the signal from the copper telephone line onto a network backbone, and eventually to the Internet with an "always-on" dedicated Internet connection.<sup>13</sup> There are several DSL flavors, including Symmetrical Digital Subscriber Line ("SDSL"),<sup>14</sup> Asymmetrical Digital Subscriber Line ("ADSL"),<sup>15</sup> ISDN Digital Subscriber Line ("IDSL"),<sup>16</sup> High-data-rate Digital Subscriber Line ("HDSL"),<sup>17</sup> and Very high-data-rate Digital Subscriber Line ("VDSL").<sup>18</sup> The number of DSL subscribers worldwide will grow twenty-two percent annually to 221 million by 2009 from the current 97 million according to a Research & Markets study.<sup>19</sup>

A cable modem enables cable operators to provide high-speed Internet access using the same coaxial cables used to deliver cable TV.<sup>20</sup> Like DSL, cable modems offer high-speed Internet access with always-on capability and speed.<sup>21</sup> Cable modem speeds vary by type of cable modem, cable network, and traffic load but are generally faster than dial-up Internet access.<sup>22</sup>

Although cable modems use shared bandwidth on the same cable system with asymmetric speeds that vary depending on the number of people on the network, DSL service provides a dedicated connection whose performance depends on the distance between the end-user and the phone company central office.<sup>23</sup>

Wireless access providers connect homes and businesses to the Internet using wireless or radio connection technology through mobile or

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12. *Id.*

13. *Id.*

14. SDSL is typically used "for business applications such as video conferencing. The traffic from the user to the network is upstream traffic, and from the network to the user is downstream traffic." Traffic in both directions at an equal data rate is symmetric service. *Id.*

15. ADSL is used primarily by residential users who receive but don't send much data. ADSL provides faster downstream than upstream speeds. Asymmetric service refers to the upstream data rate being lower than the downstream rate. *Id.*

16. IDSL provides symmetrical connection with Integrated Services Digital Network (ISDN), and "is designed to extend DSL to locations with a long distance to a telephone central office." *Id.*

17. "HDSL provides fixed symmetrical high speed access at T1 rate (1.5 Mbps), and is designed for business purposes." *Id.*

18. "VDSL provides both symmetrical and asymmetrical access with very high bit rate over the copper line." *Id.*

19. *DSL Subscribers Worldwide to More than Double by 2009*, TELECOM A.M., Apr. 18, 2006.

20. HIGH SPEED INTERNET ACCESS, *supra* note 10.

21. HIGH SPEED INTERNET ACCESS, *supra* note 10.

22. HIGH SPEED INTERNET ACCESS, *supra* note 10.

23. HIGH SPEED INTERNET ACCESS, *supra* note 10.

fixed wireless technologies.<sup>24</sup> Mobile wireless Internet access transmits information basically the same way wireless phone calls are transmitted.<sup>25</sup> Radio waves travel from the wireless device to a nearby base station, which sends the information through the telephone network and Internet to its destination.<sup>26</sup> With fixed wireless technology, a computer or network employs a radio link from the customer's location to the service provider, usually through a direct line of sight between rooftop antennas.<sup>27</sup> "Fixed wireless access customers can be located between 2 and 35 miles from the wireless provider's network between the two locations," and have "access at speeds ranging from one up to 155 megabits per second (Mbps)."<sup>28</sup>

Wi-Fi, or wireless fidelity, allows users to connect to the Internet using short-range signals, and it is available at thousands of hotspots around the country such as restaurants, parks, airports, and other public places. A directory of Wi-Fi hotspots in the United States and worldwide is available at <http://www.wififreespot.com> and <http://wi-fi.com/hotspot-hotspot-directory-browse-by-country.htm>.

WiMAX is an acronym that stands for Worldwide Interoperability for Microwave Access and is a standards-based wireless technology that provides high-throughput broadband connections over long distances.<sup>29</sup> WiMAX, sometimes referred to as "Wi-Fi on steroids," can be used for a number of applications, including broadband connections, hotspots, cellular backhaul, and high-speed business enterprise connectivity.<sup>30</sup> WiMAX is similar to Wi-Fi in concept, but it permits usage over much greater distances. WiMAX based on IEEE 802.16 standards provides<sup>31</sup> up to 50 km (31 miles) of linear service area range with practical maximum data rates between 500 kbps and 2 Mbps, depending upon conditions.<sup>32</sup> According to Intel, WiMAX provides the best and the most cost-effective broadband solution to expand service to underserved markets because the cost of deploying and providing traditional broadband services is prohibitively expensive.<sup>33</sup> The number of mobile WiMAX subscribers is

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24. HIGH SPEED INTERNET ACCESS, *supra* note 10.

25. HIGH SPEED INTERNET ACCESS, *supra* note 10.

26. HIGH SPEED INTERNET ACCESS, *supra* note 10.

27. HIGH SPEED INTERNET ACCESS, *supra* note 10.

28. HIGH SPEED INTERNET ACCESS, *supra* note 10.

29. Wikipedia.org, WiMax, <http://en.wikipedia.org/wiki/Wimax> (last visited Nov. 7, 2006).

30. *Id.*

31. Elena Malykhina & J. Nicholas Hoover, *In Depth: Intel's Chip Plans Give WiMax a Mighty Push Forward*, INFORMATIONWEEK, July 3, 2006, available at <http://www.informati.onweek.com/story/showArticle.jhtml?articleID=190100015>.

32. *Id.*

33. UNDERSTANDING WI-FI AND WiMAX AS METRO-ACCESS SOLUTIONS, INTEL WHITE PAPER, 2004, at 14, <http://www.intel.com/netcomms/technologies/wimax/304471.pdf>.

projected to increase from 1.7 million in 2007 to 21.3 million by 2012.<sup>34</sup>

Although WiMAX threatens to overtake Wi-Fi as a stronger technology, in the long term WiMAX will likely complement Wi-Fi by providing more ubiquitous coverage, greater scalability, carrier-class functionality, and better support for mixed applications needs that require high security and quality of service.<sup>35</sup>

Wireless carriers are providing high-speed broadband access on mobile phones using "third generation" or 3G technology that gives mobile phone users "the ability to access the Internet via their phone at speeds up to 2 Mbps" for multi-media types of services.<sup>36</sup> Most national wireless carriers provide data services on their networks, and many have upgraded their networks to provide mobile Internet and broadband access at speeds comparable to or greater than landline dial-up Internet access.<sup>37</sup> Verizon Wireless Broadband Access, Sprint Mobile Broadband, and Cingular BroadBand Connect offer a broadband-like experience with download speeds consistently topping 500 kbps.<sup>38</sup> Sprint's Power Vision 3G network, based on Qualcomm's Evolution Data Optimized ("EVDO") technology is available to about 150 million people, and its EVDO Revision A will deliver faster download speeds for multimedia content up to ten times faster than the first generation EVDO.<sup>39</sup> Sprint is expected to continue to use its EVDO wireless broadband technology as it rolls out WiMAX alongside it to build a \$2.5 billion 4G wireless Internet network capable of four Mbps download speed.<sup>40</sup> Sprint Nextel's Chairman claims that Sprint Nextel is not a telecom carrier, but a data services company focused on content and entertainment distribution.<sup>41</sup> In 2006, Sprint Nextel estimated

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34. *Wireless*, COMM. DAILY, Aug. 1, 2006 (on file with the *Federal Communications Law Journal*).

35. See Roberta Wiggins, *Earthlink and Google Redefine Public/Private Partnerships in Municipal Broadband Wireless*, YANKEE GROUP, Oct. 31, 2005.

36. HIGH SPEED INTERNET ACCESS, *supra* note 10. "A proposal to allow wireless broadband providers to use vacant frequencies between TV channels is gaining support in Congress," which could facilitate delivery of high-speed access to underserved rural areas. Paul Davidson, *Plan Would Widen Rural Areas' Access to High-Speed Service, Vacant Frequencies Between TV Channels Could Go to Wi-Fi*, USA TODAY, Mar. 14, 2006, at 2B.

37. HIGH SPEED INTERNET ACCESS, *supra* note 10.

38. Stephen H. Wildstrom, *Total Wi-Fi Freedom*, BUSINESS WEEK ONLINE, Apr. 3, 2006, [http://www.businessweek.com/magazine/content/06\\_14/b3978040.htm](http://www.businessweek.com/magazine/content/06_14/b3978040.htm).

39. Paul Taylor, *Sprint Nextel Speeds Rollout of 3G Network*, FIN. TIMES, Mar. 31, 2006, available at <http://news.ft.com/cms/s/66b3bd38-c044-11da-939f-0000779e2340.html>.

40. Amol Sharma & Don Clark, *Sprint Bets on New Wireless 'WiMax'*, WALL ST. J., Aug. 8, 2006, at B1; Arshad Mohammed, *Sprint Nextel to Build \$2.5 Billion Wireless Network*, WASH. POST, Aug. 9, 2006, at D4; *Sprint Picks WiMAX for 4G Mobile Networks*, COMM. DAILY, Aug. 9, 2006.

41. Charlie Anderson, *Sprint Affirms 2006 Forecast*, KAN. CITY BUS. J., Mar. 7, 2006, available at <http://kansascity.bizjournals.com/kansascity/stories/2006/03/06/daily14.html>.

that it would spend \$6.3 billion that year to upgrade its network and deploy so-called 4G services using spectrum that it already owns.<sup>42</sup>

A key difference between 3G, 4G, and Wi-Fi services is the manner in which spectrum is obtained for these services. 3G and 4G service providers pay for FCC licenses to use spectrum for these services, while Wi-Fi generally uses allocated spectrum without an FCC license. Many cities, college campuses, hospitals, malls, warehouses, stadiums, K-12 schools, amusement parks, and office buildings have built networks using unlicensed spectrum and small-area devices that collectively cover large areas.<sup>43</sup> Lack of coordination on the use of unlicensed spectrum raises critical signal interference issues that could impact the success of both licensed and unlicensed spectrum operations. Coordination on hardware design and signal processing software is necessary to address signal interference.

Broadband access via satellite is another wireless alternative that is ideal for businesses and consumers who do not have traditional broadband access, such as people residing in remote areas.<sup>44</sup> A user must have a two or three foot dish ("base station"), a satellite Internet modem, and a clear line of sight to the provider's satellite.<sup>45</sup>

Broadband access via FTTH is an alternative that uses long, thin transparent fibers of glass or plastic about the diameter of a human hair and arranged in bundles called optical cables that are used to transmit light signals over long distances.<sup>46</sup> While costs vary, FTTH installations average \$2,100 and make phone, digital and basic cable TV, video-on-demand, pay-per-view services, and high-speed Internet access available.<sup>47</sup>

Broadband over power lines ("BPL") delivers data communications over the existing electric power distribution network at DSL and cable modem speeds. BPL effectively offers a third access "pipe" to the home or business as a possible alternative to existing telephone and cable facilities. It transmits the user signal over the low voltage (110/220V) and medium voltage (4-20KV) power distribution grid and uses the existing electric

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42. Taylor, *supra* note 39.

43. J.H. Snider, *Reclaiming the Vast Wasteland, The Economic Case for Re-Allocating the Unused Spectrum (White Space) Between TV Channels 2 and 51 to Unlicensed Service 8* (New Am. Found., Wireless Future Program, Working Paper No. 13, 2006), available at <http://www.newamerica.net/files/WorkingPaper13.UnlicensedEconCase.Snider.pdf>.

44. FCC Consumer Facts, *High Speed Internet Access — "Broadband"*, Mar. 15, 2006, <http://www.fcc.gov/cgb/consumerfacts/highspeedinternet.html>.

45. *Id.*

46. *Id.*

47. FCC Consumer Facts, *High Speed Internet Access — "Broadband"*, 2003, <http://library.findlaw.com/2003/Aug/8/132970.html>.



wires and outlets for delivery of the user signal at home.<sup>48</sup> BPL is an emerging technology, but it may reach virtually every household in the nation with broadband access, voice, and other services.<sup>49</sup>

There are two commercial BPL deployments in the United States.<sup>50</sup> Cinergy provides BPL-based services in Cincinnati, Ohio to an estimated 50,000 customers, and the "City of Manassas, Virginia provides municipal BPL service to about 1,200 customers."<sup>51</sup> In New York, Consolidated Edison has deployed BPL as a trial in Briarcliff Manor, parts of Manhattan, and Orange County. Meanwhile New Visions PLC, LLC has deployed BPL in Solvay on a trial basis.<sup>52</sup> California established a BPL rulemaking, and Texas modified certain statutes that affect BPL deployment.<sup>53</sup>

The New York Public Service Commission ("NYPSC") recently sought input with respect to BPL status, safety and reliability issues, business models, and the appropriate regulatory framework.<sup>54</sup> The NYPSC tentatively concluded that incumbent electric utilities should not function as the BPL provider, but rather the utility should lease or sell access rights for its system to business entities to bring BPL to the public.<sup>55</sup> Regardless of which regulatory model the NYPSC adopts, regulators should ensure that electric utility customers do not subsidize the electric utility provision of BPL services.

To promote access to broadband services and encourage new facilities-based broadband platforms, the FCC recently "affirmed its rules for Access Broadband over Power Line . . . systems while maintaining safeguards against harmful interference to existing radio services."<sup>56</sup> Specifically, the FCC affirmed 1) its rules regarding emission limits for BPL; 2) the July 7, 2006 deadline for requiring certification for any equipment manufactured, imported, or installed on BPL systems; and 3) the requirement that BPL deployment information must be provided in a public

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48. *Id.*

49. *Id.*

50. Proceeding on Motion of the Commission to Examine Issues Related to the Deployment of Broadband over Power Line Technologies, Case 06-M-0043 at 2 (N.Y. Pub. Ser. Comm'n. Jan. 25, 2006) (order initiating proceeding and inviting comments) [hereinafter *Deployment of Broadband*] (on file with the *Federal Communications Law Journal*).

51. *Id.*

52. *Id.*

53. *Id.*

54. See generally *Deployment of Broadband*, *supra* note 50.

55. *Deployment of Broadband*, *supra* note 50, at 8.

56. Press Release, FCC, FCC Adopts Memorandum Opinion and Order on Broadband Over Power Lines to Promote Broadband Service to All Americans, Aug. 3, 2006, available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-266773A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-266773A1.pdf).

database at least thirty days before deployment of that equipment.<sup>57</sup> The FCC also classified BPL-enabled Internet access service as an information service under the Communications Act of 1934, as amended, because it offers a single, integrated service (*i.e.*, Internet access) to end users, combining computer processing, information provision, and computer interactivity with data transport, enabling end users to run a variety of applications to store, transform, process and retrieve information via telecommunications.<sup>58</sup>

By almost any measure, broadband demand is exploding. High-speed lines, advanced services, and mobile telephony continue to be the leading areas of growth within the telecommunications sector. In 2004, high-speed lines delivering services to residential, small businesses, larger businesses, and other subscribers at speeds exceeding 200 kbps in at least one direction increased by 34% to 37.9 million lines.<sup>59</sup> In 2004, “[h]igh-speed lines serving residential and small business subscribers increased by 36% . . . to 35.3 million lines.”<sup>60</sup> ADSL high-speed lines increased by 45%, to 13.8 million lines in 2004, while high-speed coaxial cable connections (cable modem service) increased by 30% during 2004, to 21.4 million lines.<sup>61</sup> “The remaining 2.7 million high-speed connections in service at the end of 2004 were satellite or terrestrial wireless connections, fiber or power line connections, or wire-line connections other than ADSL.”<sup>62</sup> In 2004, advanced services lines (delivering services at speeds exceeding 200 kbps in both directions using all technology types) increased by 42%.<sup>63</sup>

The FCC’s data as of December 31, 2005 shows continued demand acceleration for high-speed lines delivering services at speeds exceeding 200 kbps in at least one direction, with an 18% increase (from 42.4 million to 50.2 million) during the second half of 2005 and a 33% increase of 12.3 million lines for the year ending December 31, 2005.<sup>64</sup> “Of the 50.2 million total high-speed lines [reported to the FCC] as of December 31, 2005 . . . [c]able modem services represented 57.5% of these lines, 40.5% were . . .

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57. *Id.*

58. United Power Line Council’s Petition for Declaratory Ruling Regarding the Classification of Broadband Over Power Line Internet Access Service as an Information Service, *Memorandum Opinion and Order*, FCC 06-165, paras. 1, 8 (2006).

59. Press Release, FCC, FCC Releases Data on High-Speed Servs. for Internet Access (July 7, 2005), available at [http://www.fcc.gov/Bureaus/Common\\_Carrier/Reports/FCC-State\\_Link/IAD/hspd0705.pdf](http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/hspd0705.pdf).

60. *Id.*

61. *Id.* at 2.

62. *Id.*

63. *Id.*

64. Press Release, FCC, FCC Releases Data on High-Speed Servs. for Internet Access (July 26, 2006), available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-266593A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-266593A1.pdf).

[ADSL] connections, 0.3% were symmetric DSL (SDSL) or traditional wireline connections, 0.5% were fiber connections to the end-user premises, and 1.2% used other types of technology including satellite, terrestrial fixed or mobile wireless . . . and electric power line.”<sup>65</sup> The FCC noted that for the first time the 3.2 million line increase in ADSL lines exceeded the 1.6 million line increase for cable modem service, and for the full year ending December 31, 2005, ADSL increased by 5.7 million lines compared to a 4.2 million line increase for cable modem service.<sup>66</sup> Advanced services lines increased by 15% during the second half of 2005 (from 37.3 million to 42.8 million) and by 48% (or 13.9 million lines) for the year ending December 31, 2005.<sup>67</sup> In the second half of 2005, 2.75 million (35%) of the new broadband additions were for mobile wireless compared to 41% for DSL and 20% for cable, meaning that “[w]ireless broadband is obviously going to be big.”<sup>68</sup>

The FCC data also shows that high-speed line subscribership increases with population density and median household income.<sup>69</sup> For example, high-speed subscribers are present in 99% of the most densely populated zip codes and in 88% of zip codes with the lowest population densities.<sup>70</sup> Not surprisingly, California, New York, Florida, and Texas have the most high-speed lines,<sup>71</sup> while rural areas continue to trail urban areas in Internet and high-speed line access. High-speed data line subscribers are also present in 99% of the top one-tenth of zip codes ranked by median household income, compared to their presence in 90% of zip codes with the lowest median household income.<sup>72</sup>

Given this high demand for broadband, municipalities are jumping on the bandwagon to provide broadband and other telecommunications services to their customers. This is especially true in areas where such services are either not available or only available to a lesser extent.

### III. POSSIBLE JUSTIFICATIONS FOR MUNICIPAL BROADBAND

There are several possible reasons for municipal telecommunications services, particularly broadband, in the United States. Boosting economic development, expanding broadband scope and reach, improving quality of life, lowering prices, and creating competition are most often cited as

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65. *Id.* at 1–2.

66. *Id.* at 2.

67. *Id.*

68. Howard Buskirk et al., *Cable, DBS Up Ante for T-Mobile as Make-or-Break Auction Begins*, COMM. DAILY, Aug. 7, 2006.

69. HIGH SPEED SERVICES FOR INTERNET ACCESS, *supra* note 10, at 4.

70. HIGH SPEED SERVICES FOR INTERNET ACCESS, *supra* note 10, at 4.

71. HIGH SPEED SERVICES FOR INTERNET ACCESS, *supra* note 10, at Table 10.

72. HIGH SPEED SERVICES FOR INTERNET ACCESS, *supra* note 10, at 4.

reasons for municipalities providing telecommunications services. Sometimes the need may be justified, and sometimes it clearly is not.

Some “[c]onsumer groups and big online brands” claim that recent telecom mergers “are creating a growing threat to the openness of the Internet by consolidating power in the hands of companies that provide access to the Web.”<sup>73</sup> Some municipal broadband advocates argue that municipal broadband would offer municipalities more pricing control over the content that passes through their networks.

Where there is no demonstrated need for the municipal telecommunications system or its costs are underestimated, the result can be disastrous and an unwelcome drain on local governments and their citizens, while also upsetting delicate competitive industry dynamics. The justification for municipal telecom entry should be objectively evaluated and documented before the decision is made to commit public resources to such projects.

For example, in Bristol, Virginia, the average cost per customer exceeded \$2,000, and Bristol Virginia Utilities (“BVU”) budgeted more than \$1 million in its 2005 fiscal year to hook up 540 customers on its Fiber to the Premise (“FTTP”) OptiNet system offering phone, Internet, and cable TV service.<sup>74</sup> As of September, 2005, BVU’s “[l]osses for the past two fiscal years totaled \$5.9 million and [were] projected at \$2.3 million for the [2005] fiscal year . . . despite grants of \$800,000 in fiscal year 2004-2005 and a projected \$8 million in the [2005] fiscal year.”<sup>75</sup> Specifically, according to OptiNet’s financial statements, for the fiscal year ended June 30, 2004, OptiNet had net losses of \$1,197,100 (telephone), \$563,935 (data) and \$702,358 (CATV).<sup>76</sup>

#### IV. SPEED, FEATURE, AND PRICE CONSIDERATIONS<sup>77</sup>

In response to municipal broadband threats, some industry representatives claim that municipal broadband is not competitive with their products. For example, in response to the District of Columbia’s

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73. Yuki Noguchi, *AT&T Deal Raises Issue of Internet Control*, WASH. POST, Mar. 9, 2006, at D5.

74. Joe Geraghty, *Optinet Hopes to Reach 1,000 Additional Customers this Year*, BRISTOL HERALD COURIER, Sept. 18, 2005, available at <http://www.sullivan-county.com/id6/telecom/optinet2005.htm>.

75. Jerry Chorosevic, Sr., *OptiNet Losses Questioned*, BRISTOL HERALD COURIER, Sept. 27, 2005, available at <http://www.sullivan-county.com/id6/telecom/optinet2005.htm>.

76. BVU, OptiNet Statement of Income, Departments Fiscal Year Ended June 30, 2004 (on file with the *Federal Communications Law Journal*).

77. Prices and features noted in this article are subject to change, and the author assumes no liability or responsibility for their accuracy or reliance on them. Subscribers are encouraged to confirm prices, features, and availability before purchasing services.

wireless Internet proposal, a Comcast representative said that “municipally sponsored or subsidized Internet proposals are not competitive with Comcast’s service because we offer faster speeds, greater reliability and more features.”<sup>78</sup>

The devil is in the details. Different plans have different prices, features, and service bundles that change frequently. In their battle for a share of the consumer’s wallet, telephone companies, cable companies, and municipalities are striving to offer the quadruple play of video, high-speed Internet/data, telephone service, and wireless phone service.

As of the publication date of this article, cable or telco-provided residential high-speed Internet is typically available at standard rates from \$34.95 to \$199.95 per month for downstream speeds ranging from 5 to 30 Mbps.<sup>79</sup> By comparison, EarthLink, which will build Philadelphia’s proposed wireless project, plans to charge about \$20 a month (\$10 per month for low-income residents) at speeds of 1 Mbps.<sup>80</sup> While 1 Mbps may be acceptable for some applications, some would consider it too slow for rapid video downloads or similar applications with high bandwidth requirements. According to BVU’s website, as of the publication date for this article, OptiNet’s 64/Kb download speed broadband product starts at \$16.95 and goes up to \$39.56 per month for 5 Mbps download (256 Kbps upload) speed.<sup>81</sup>

Bundling is key to meeting customers’ needs. Offering these services and charging for them on one bill is critical. “Five million households get phone service from their cable provider, and 1.5 million customers get satellite television on the same bill as Internet and phone . . . .”<sup>82</sup> “Cox Communications . . . has more than 1 million subscribers who buy three services from [it],” and it “typically offers at least a \$10 discount for customers who sign up for two products.”<sup>83</sup> Time Warner Cable and several other cable companies plan to add wireless service through Sprint Nextel, combining entertainment, communications, and wireless services.<sup>84</sup> An aggressive British company, Carphone Warehouse, “began marketing free broadband to those agreeing to pay £21 a month for its TalkTalk home

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78. Arshad Mohammed, *District to Seek Wireless Internet That Aids Poor*, WASH. POST, Mar. 9, 2006, at D5.

79. See, e.g., *id.*

80. *Id.*

81. BVU, Optinet, <http://www.bvub.com/contentMid.aspx?ObjectId=47> (last visited Nov. 9, 2006).

82. Yuki Noguchi, *No Bundle of Joy: Some Buyers Find Packaged Telecom Services a Tangle of Trouble*, WASH. POST, Mar. 22, 2006, at D2.

83. *Id.*

84. *Id.*

phone package.”<sup>85</sup>

Bundling is also prevalent with wireless broadband plans offering broadband access at speeds exceeding 500 kbps. For example, Verizon Wireless Broadband Access’s unlimited data service is available for \$60 a month with a two-year contract with a Verizon phone voice plan.<sup>86</sup> Sprint Mobile Broadband’s similar deal is available with a free PC wireless card, while Cingular Broadband Connect’s \$139-a-month plan is available with unlimited data in the U.S. plus 100 megabytes in monthly downloads in more than a dozen countries for Cingular customers with a Cingular voice plan.<sup>87</sup>

According to Bank of America analysts, “[t]elephone companies are discounting advertised entry-level triple-play rates 15 per cent versus cable, nearly double the discount a year ago.”<sup>88</sup> For example, in Herndon, Virginia, Cox Communications has been providing bundled services for some time and charging \$130 a month until Verizon Communications introduced a less expensive \$109 package.<sup>89</sup> “In response, Cox customers who threatened to close their accounts are being offered a \$90 monthly rate to stay.”<sup>90</sup> As of the publication date for this Article, Comcast’s first year promotional triple-play packages of video, Internet, and telephone service are available from \$33 per month, depending upon availability and features.<sup>91</sup> Cablevision’s triple play package of digital cable, Optimum online with download speeds of up to 10 Mbps, and Optimum Voice is available in Cablevision’s service territory for \$29.95 per month during the first year.<sup>92</sup> Time Warner Cable’s triple-play service bundle includes VoIP with unlimited local, intrastate, and domestic long distance calling, video and high-speed Internet access for \$39.95/month, including caller ID, call waiting ID, voicemail, and other features.<sup>93</sup> VoIP allows users to cut their local and long-distance phone bills by making calls over the Internet using

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85. Miles Brignall, ‘Free’ Broadband Sparks Price War, *GUARDIAN*, Apr. 15, 2006, available at <http://money.guardian.co.uk/print/0,,329457890-111457,00.html>.

86. Wildstrom, *supra* note 38.

87. Wildstrom, *supra* note 38.

88. Aline van Duyn & Paul Taylor, *Battle of the Bundle is at the Doorstep*, *FIN. TIMES*, Mar. 17, 2006, at 1.

89. *Id.*

90. *Id.*

91. See Press Release, Comcast, Comcast Reaches One Million Comcast Digital Voice Customers (Sept. 20, 2006), available at <http://www.cmcsk.com/phoenix.zhtml?c=118591&p=irol-newsArticle&ID=907282&highlight=>.

92. News Release, Cablevision, Cablevision Launches “Optimum Rewards” (Feb. 16, 2005), available at [http://www.cablevision.com/index.jhtml?id=2005\\_02\\_16](http://www.cablevision.com/index.jhtml?id=2005_02_16).

93. Cisco Systems, Time Warner Cable Succeeds with Innovative “Triple Play” Voice Services”, [http://www.cisco.com/application/pdf/en/us/guest/netsol/ns550/c654/cdccont\\_0900aecd8026c5b8.pdf](http://www.cisco.com/application/pdf/en/us/guest/netsol/ns550/c654/cdccont_0900aecd8026c5b8.pdf) (last visited Nov. 9, 2006).

software that converts voice signals to data packets.<sup>94</sup> Comcast charges \$40 per month for its Digital Voice VoIP product if the customer also buys cable and high-speed Internet.<sup>95</sup>

VoIP that runs over Wi-Fi links ("VoWi-Fi") may become the latest addition to bundled services. Wi-Fi allows VoIP users to cut the cord and talk or work anywhere Wi-Fi is available. "Nokia, Samsung and Motorola are offering or plan to introduce phones designed for use on both traditional cell or Wi-Fi networks."<sup>96</sup> T-Mobile is testing a service that "will allow its subscribers to switch seamlessly between connections to cellular towers and Wi-Fi hotspots, including those in homes and . . . Starbucks [stores]."<sup>97</sup> Sprint is also working on deployment of a wireless phone that will switch to VoWi-Fi when users are at home.<sup>98</sup> Wi-Fi may offer better voice quality than traditional cellular service and enhances videoconferencing and other data services on mobile devices, but Wi-Fi hotspots have much more limited range than cellular networks and their use of unlicensed spectrum may cause interference and dropped calls.<sup>99</sup> Nevertheless, by 2010 there will be an estimated 100 million dual-mode wireless phones with built-in Wi-Fi capability.<sup>100</sup>

Faced with these fast-changing and highly competitive market dynamics, it is critical for municipalities and any other prospective broadband service providers to assess demand and pricing for their proposed services well before deployment.<sup>101</sup> Highly competitive pricing of bundled triple and quadruple-play services also shows that the private sector is meeting demand for these services in many areas, particularly in more densely populated areas. Government sponsored deployment of these services, where demand is already being met, poses overcapacity and economic risks for the industry, governments, and taxpayers. The *Field of Dreams* "Build It and They Will Come" approach is clearly not an

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94. Danny Bradbury, *Time to Unplug the Phone: VoIP Technology's Next Frontier Extends Telephony's Reach to Allow Wi-Fi Calls from Cellphones*, NAT'L POST, Mar. 30, 2006, at FP11.

95. Leslie Brooks Suzukamo, *Comcast Offers Internet Phones*, ST. PAUL PIONEER PRESS, Mar. 28, 2006, at C1.

96. Matt Richtel, *The Wi-Fi in Your Handset*, N.Y. TIMES, July 29, 2006, available at <http://www.nytimes.com/2006/07/29/technology/29phones.html?ex=1311825600&en=f4e35ba52faa0380&ei=5090>.

97. *Id.*

98. See Suzukamo, *supra* note 95.

99. See Richtel, *supra* note 96.

100. *ABI Research Forecasts Over 100 Million Cellular/VoWi-Fi Phones in 2010*, ABI RESEARCH, May 9, 2005, <http://www.abiresearch.com/abiprdisplay.jsp?pressid=464>.

101. For a municipal wireless Internet service deployment decision tree analysis, see FTC STAFF REPORT, MUNICIPAL PROVISION OF WIRELESS INTERNET, Fig. 1 (Sept. 2006) available at <http://www.ftc.gov/os/2006/10/V060021municipalprovwirelessinternet.pdf> [hereinafter FTC STAFF REPORT].

appropriate model for broadband deployment.

## V. MUNICIPAL BROADBAND STATUS

### A. *Municipal Broadband Deployment*

Federal law generally supports municipalities' provision of telecommunications services. For example, Section 253(a) forbids state or local statutes or regulations that prohibit any entity from providing any interstate or intrastate telecommunications service.<sup>102</sup> Similarly, the Cable Act gives municipalities broad authority to enter the cable market.<sup>103</sup>

In light of these broad federal mandates, municipal-provided telecommunications services have spiraled over the past few years. The actual number of municipalities offering telecommunications services varies depending on the source. Balhoff & Rowe, LLC reports that "approximately 23 municipally-sponsored fiber networks provide commercial telecommunications services in the U.S."<sup>104</sup> It is estimated that U.S. municipalities will spend about \$700 million in three years on municipal wireless broadband, and the U.S. municipal wireless market will have an annual growth rate of 134% between the end of 2004 and the end of 2007.<sup>105</sup> The Yankee Group reports that "more than 350 municipalities across the globe are building and partnering with local providers to extend existing infrastructure to bridge the local digital divide."<sup>106</sup>

Municipal-sponsored or partnered Wi-Fi networks are expanding quickly. "So far, nearly 200 municipalities have announced plans for citywide wireless networks, issued bid requests, or built networks . . ."<sup>107</sup> According to the Wireless Internet Institute, "out of the roughly 40,000 cities and towns across the country, only about 300 'early adopters' have formulated municipal broadband projects" that are being deployed or in the final stages.<sup>108</sup> But cities are groping for the best operation model for such

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102. "No State or local statute or regulation, or other State or local legal requirement, may prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service." 47 U.S.C. § 253(a) (2000).

103. See, e.g., 47 U.S.C. § 533(e) (2000).

104. MICHAEL J. BALHOFF & ROBERT C. ROWE, *MUNICIPAL BROADBAND: DIGGING BENEATH THE SURFACE* 27 (2005), <http://www.balhoffrowe.com/documents.htm> (click on hyperlink titled *MUNICIPAL BROADBAND: DIGGING BENEATH THE SURFACE*). See Tables 7 and 8 for an overview of municipal video services networks and municipal fiber networks.

105. John Spofford, *U.S. Cities to Spend Big on Wireless Broadband*, TELECOM A.M., Sept. 27, 2005.

106. Tara Howard, *Municipal Broadband: Choosing Between FTTx and Wireless*, YANKEE GROUP, Nov. 16, 2005, at 1.

107. *Wi-Pie in the Sky?*, THE ECONOMIST TECH. Q., Mar. 11, 2006, at 22.

108. *Local Governments Back Legislation to Support Municipal Broadband Networks*, TR DAILY, Mar. 14, 2006, at 9 [hereinafter *Local Governments Back Legislation*].



networks.<sup>109</sup> “Some networks will be supported by advertising; [but] many will charge fees of \$15–25 per month” and offer free access at certain times or to low income users.<sup>110</sup>

MobilePro Corp. reported in March 2006 that it “completed the primary deployment of its WazTempe network with more than 550 access points throughout Tempe, Ariz.”<sup>111</sup> Touted as “North America’s largest citywide wireless network,” this is a good example of productive partnering between local government and industry partners.<sup>112</sup> Another network is under construction in Chandler, Arizona, and “[t]he adjacent city of Gilbert will add 76 square miles for a contiguous total network area of 187 square miles, . . . ‘substantially’ complete as of March 1, [2006].”<sup>113</sup>

Philadelphia signed contracts with EarthLink that include “4,000 utility poles and \$300,000 in utility payments from EarthLink per year plus \$2 million in advance payments against revenue [that] will be used to purchase 10,000 computers and training for low-income families.”<sup>114</sup> “The non-profit Wireless Philadelphia will receive five percent of EarthLink’s revenue,” and “EarthLink will also provide \$9.95 per month accounts for up to 25,000 low-income households and 22 free Wi-Fi hotspots around [town].”<sup>115</sup> EarthLink’s wholesale rate will be \$12 per month, which could vary based on volume of customers by retail partners. Retail pricing is expected to be about \$20 per month, but some retail partners may offer lower prices.<sup>116</sup> The ten-year contract is estimated to cost \$20 to \$22 million to fulfill, but no city tax dollars would be used for the 135-square-mile network.<sup>117</sup> A city survey “found that 72% of internet-connected households used dial-up connections, compared with 47% nationally.”<sup>118</sup>

Boston, on the other hand, will tap a nonprofit corporation to own and operate its Wi-Fi network, funded with \$16 to \$20 million raised from local

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109. *Id.*

110. *Wi-Pie in the Sky?*, *supra* note 107, at 22.

111. Press Release, MobilePro Corp., MobilePro Announces Substantial Completion of WazTempe (Mar. 1, 2006), *available at* <http://www.hawkassociates.com/moblpr204.aspx>.

112. *Id.*

113. Glenn Fleishman, *Municipal Round-Up: Washington (D.C.), Western N.Y.*, WNN Wi-Fi NET NEWS, Mar. 9, 2006, <http://wifinetnews.com/archives/006357.html> (last visited Nov. 9, 2006) [hereinafter *Municipal Round-Up*].

114. Glenn Fleishman, *Philadelphia Closes Deal with EarthLink, Releases Terms*, WNN Wi-Fi NET NEWS, Mar. 1, 2006, <http://wifinetnews.com/archives/006332.html> (last visited Nov. 9, 2006).

115. *Id.*

116. *Id.*

117. *Id.*; *Localities Share Municipal Broadband Rollout Challenges*, TR DAILY, Mar. 24, 2006.

118. *Wi-Pie in the Sky?*, *supra* note 107, at 22.

businesses and foundations.<sup>119</sup> Construction of the city-wide network will begin in 2007, using fiber optic cable connecting city sites to the Internet backbone of radio transmitters to send wireless signals from city-owned buildings, poles, or traffic lights.<sup>120</sup>

Miami Beach awarded IBM a \$5 million contract to be paid out of city funds for free Wi-Fi service up to the third floor, which is a problem in a town of high rise apartments.<sup>121</sup> Not surprisingly, some wireless providers are “hopping mad,” noting that 50 to 80 percent of residents will not have access to this network.<sup>122</sup> Buffalo and Batavia, New York received about \$350,000 in matching funds for expanding Wi-Fi access.<sup>123</sup> Matching funds of \$1.4 million will be distributed to twenty-nine communities via New York’s High-Tech Initiative.<sup>124</sup>

Madison, Wisconsin is working with Cisco on a Wi-Fi network that will cover the entire city, including the airport, by early 2007.<sup>125</sup> “Through a grant from a technology-promoting group, the Cape Cod Technology Council hopes to start deploying advertising-supported free Wi-Fi with cooperation of local businesses.”<sup>126</sup> Similarly, Nortel Networks proposed in a letter of intent to provide a Wi-Fi network for Waukesha, Wisconsin, while Midwest Fiber Networks is building a \$20 million wireless network for Milwaukee.<sup>127</sup> Other municipal Wi-Fi networks are underway in Toronto, Ontario; St. Cloud, Florida; Burleson, Texas; and Portsmouth, New Hampshire.<sup>128</sup>

San Francisco’s Mayor, Gavin Newsom, boldly declared, “‘We will not stop until every San Franciscan has access to free wireless-internet service’. . . as he announced plans in October 2004 for a Wi-Fi network that would blanket the city with wireless-internet coverage.”<sup>129</sup> The City of San Francisco recently announced that it “selected Google and EarthLink

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119. Robert Weisman, *Hub Sets Citywide WiFi Plan*, BOSTON GLOBE, July 31, 2006, at A1.

120. *Id.*

121. *Municipal Round-Up*, *supra* note 113.

122. *Municipal Round-Up*, *supra* note 113.

123. *Municipal Round-Up*, *supra* note 113.

124. *Municipal Round-Up*, *supra* note 113.

125. Glenn Fleishman, *Municipal Round-Up: Madison (Wisc.), Orleans (Mass.)*, WNN Wi-Fi NET NEWS, <http://wifinetnews.com/archives/006347.html> (last visited Nov. 9, 2006).

126. *Id.*

127. *Nortel Makes Proposal on Wis. Wi-Fi Network*, TELECOM A.M., Mar. 23, 2006.

128. Glenn Fleishman, *Municipal Round-Up: Toronto (Ont.), St. Cloud (Fla.), Portsmouth (N.H.), Peoria (Ill.), New York City, Ricochet (all over)*, WNN Wi-Fi NET NEWS, <http://wifinetnews.com/archives/006343.html> (last visited Nov. 9, 2006); Terry Maxon, *Burleson OKs Wi-Fi System*, DALLAS MORNING NEWS, Mar. 20, 2006, at 2D.

129. *Wi-Pie in the Sky?*, *supra* note 107, at 22.

to build the wireless network.”<sup>130</sup>

The New York City Council passed legislation that “creates a joint public broadband commission to advise the Mayor and the City Council of New York on how the resources of City government can be used to stimulate the private market so that residents and businesses of New York City have more options for high-speed Internet access.”<sup>131</sup>

Portland, Oregon’s MetroFi Wi-Fi mesh wireless, advertising-supported network will be available free to users at speeds up to one Mbps at no cost to the city.<sup>132</sup> MetroFi will also offer subscriber-based plans to local firms.<sup>133</sup>

The City of Anaheim’s Wi-Fi system is available for \$21.95 per month for “normal EarthLink email and online services, plus a Wi-Fi bridge for existing EarthLink subscribers and those that sign up for a year of service.”<sup>134</sup>

Sprint Nextel’s incumbent local exchange carrier (“ILEC”) business, which was spun off as EMBARQ in 2006, partnered with the City of Henderson, Nevada in a Wi-Fi trial that provides Henderson with the opportunity to use the latest wireless broadband technology while providing “Sprint with a vital market and partner to measure user experience and acceptance of the technology.”<sup>135</sup> This is one of the first trials between a local carrier and a municipality.

Similarly, the City of Riverside and AT&T, Inc. agreed that “AT&T will provide a citywide Wi-Fi wireless broadband Internet access network which will ultimately cover the city’s 80-plus square miles.”<sup>136</sup> AT&T claims that it will be “the largest Wi-Fi network . . . designed for both public and municipal use.”<sup>137</sup>

Unlike other municipalities, such as Philadelphia and San Francisco, that have commissioned city-wide networks, the District of Columbia government plans to award a Wi-Fi network contract to the firm that does

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130. Laurie J. Flynn, *Some Worries as San Francisco Goes Wireless*, N.Y. TIMES, Apr. 10, 2006, at C5.

131. Press Release, The Council of the City of New York, Council Member Gale A. Brewer, Brewer Passes Legislation Creating a Public Broadband Advisory Committee (Dec. 21, 2005) (on file with the *Federal Communications Law Journal*).

132. *MetroFi to Build Free Network for Portland*, COMM. DAILY, Apr. 14, 2006.

133. *Id.*

134. Glenn Fleishman, *EarthLink Launches Anaheim*, WNN WI-FI NET NEWS, June 29, 2006, <http://wifinetnews.com/archives/006713.html> (last visited Nov. 9, 2006).

135. *Sprint’s Local Communications Business, Henderson, Nev., Launch Wi-Fi Trial; Sprint Provides Wireless Broadband to City*, FORBES, Mar. 20, 2006, available at <http://freepress.net/news/15869>.

136. *City of Riverside and AT&T Announce Citywide Wi-Fi Agreement*, YAHOO! FINANCE, Oct. 18, 2006, <http://biz.yahoo.com/prnews/061018/cgw025.html?v=77>.

137. *Id.*

the most for the least-advantaged residents, including offering free access, computers, and training.<sup>138</sup> Verizon, Comcast, and RCN, “which are the major companies that provide Internet access over phone and cable lines in the District, all said they will look carefully at the District’s proposal when it is published.”<sup>139</sup>

There are “[a]n estimated 175 WiMAX trials . . . worldwide, with 35 commercial fixed service offerings . . . mostly in the 3.5GHz band . . .”<sup>140</sup> Outside the United States, countries generally support improved broadband access from municipalities to work with private-sector companies.<sup>141</sup> For example, “[s]chools and government offices will have high-speed Internet access in Dublin, Ireland through Irish Broadband, and in southern Poland through SferaNet.”<sup>142</sup> The Taiwanese government has pledged “to invest \$1.12 billion on mobile initiatives including WiMAX”, and Intel’s Asian Broadband Campaign is “working to spur WiMAX development in Southeast Asia through collaborations with governments, telecommunication regulators, education, health and agriculture public sector agencies and carriers.”<sup>143</sup> More governments will likely get on the WiMAX bandwagon given 13 global carriers’ year-end 2006 launch plans for their Intel-based WiMAX networks.<sup>144</sup>

### *B. State and Federal Legislation*

Municipalities are facing challenges on several fronts in gaining entry to provide telecommunications services to their customers. At least 14 states have laws “limiting local governments’ ability to make advanced services available to citizens,” typically where there is an existing service provider, and “at least 12 additional states have considered similar legislation.”<sup>145</sup> For example, in Missouri, cities can provide Internet and

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138. Mohammed, *supra* note 78, at D1.

139. Mohammed, *supra* note 78, at D5.

140. Malykhina & Hoover, *supra* note 31.

141. See Malykhina & Hoover, *supra* note 31.

142. Laura Stotler, *Worldwide Carriers Rolling Out Commercial Deployments of Intel-Based WiMAX Networks*, IPCOMMUNICATIONS.COM, Nov. 9, 2005, <http://news.tmcnet.com/news/2005/nov/1203177.htm>.

143. *Id.*

144. The 13 carriers are: Americatel Peru S.A. (Peru), Call Plus (New Zealand), Chunghwa Telecom Co. Ltd. (Taiwan), DBD Deutsched Breitband Dienste GmbH (Germany), Digicel (Caribbean), Entel (Chile), Ertach (Argentina), Integrated Telecom Company (Saudi Arabia), Next Mobile (Philippines), Taiwan Fixed Networks (Taiwan), and VeloCom (Argentina). *Id.*

145. *Local Governments Back Legislation*, *supra* note 108, at 9. See also BALHOFF & ROWE, *supra* note 104, at 104. According to Table 32 the states as of September 2005 were: Arkansas (ARK. STAT. ANN. § 23-17-409), Colorado (SB 05-152, 2005 Gen. Assem. (Colo. 2005)), Florida (FLA. STAT. § 166.047 (2005)), Iowa (IOWA CODE ANN. § 388.10), Louisiana (SB 126 enacted on July 5, 2005 La. Legis. (La. 2005)), Maine (LD 1128, 2005 Me. Legis.

video services, but are barred from providing telephone service.<sup>146</sup> As noted below, Missouri's anti-municipal telecommunications entry legislation is particularly instructive because of its detailed review by the FCC, the United States Court of Appeals for the Eighth Circuit, and the United States Supreme Court.

Utah's limitations on municipal entry are instructive because a municipality must go through several steps before it may provide cable or public telecommunications services, including a feasibility analysis to assess demand for and impact of such municipal entry and public hearings.<sup>147</sup>

Municipal entrants have been successful in some legislative battles. For example, the 2002 Virginia Assembly authorized any locality operating an electric distribution system on March 1, 2002 to provide telecommunications services.<sup>148</sup> Virginia Code Section 15.2-2160 gives localities legal authority to provide telecommunications services, and an amendment to Virginia Code Section 56-265.4:4 gives the State Corporation Commission jurisdiction to issue certificates of public convenience and necessity to localities.

According to one source, municipalities scored victories in 2005 on fourteen pieces of telecommunications company-backed state legislation.<sup>149</sup> For example, Virginia municipalities won a battle in the 2005 Virginia legislative session with the passage of House and Senate bills that allow certain municipalities to cross-subsidize telecommunications services with revenues from other services. Virginia House Bill 1404 and Senate Bill 706, originally designed to streamline the approval of new cable television franchises, were amended to allow BVU and other municipalities to cross-subsidize their local telecommunications

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(Me. 2005) enacted May 20, 2005), Minnesota (MINN. STAT. § 237.19), Missouri (MO. REV. STAT. § 392.410), Nebraska (NEB. REV. STAT. §§ 86-575 to 86-577), Nevada (NEV. REV. STAT. §§ 268.081 to 268.088), Ohio (Ohio Rev. Chapter 1332), Pennsylvania (HB 30 enacted Dec. 2004), South Carolina (S.C. CODE §§58-9-2600 to 58-9-2650, Tennessee (TENN. CODE ANN. § 1332), Pennsylvania (HB 30, 2004 Pa. Gen. Assem. (Pa. 2004)), South Carolina (S.C. CODE ANN. §§ 58-9-2600 to 58-9-2650), Tennessee (TENN. CODE ANN. §§ 7-52-401 to 7-52-407, 7-52-601 to 7-52-611, HB 1403 (HB1402, amending § 7-52-604)), Texas (TEXAS UTIL. CODE §§ 54.201, 54.202 and 54.205, Utah (UTAH CODE ANN. §§ 10-18-101 to 10-18-306), Virginia (VA. CODE ANN. §§ 15.2-2160, and 56-265.4:4), Washington (RCW §54.16.330), and Wisconsin (2003 Wisconsin Act 278-Wisconsin Statutes § 66.0422). BALHOFF & ROWE, *supra* note 104, at 104-07. According to the FTC, at least 19 states have legislation defining "the extent to which municipalities may provide Internet service." FTC STAFF REPORT, *supra* note 101, at 3.

146. BALHOFF & ROWE, *supra* note 104, at 105.

147. UTAH CODE ANN. §§ 10-18-202 to 203 (2003).

148. 2002 Va. Acts 479, 489 (codified at VA. CODE ANN. § 15.2-2160).

149. Amol Sharma, *Companies that Fought Cities on Wi-Fi, Now Rush to Join In*, WALL ST. J., Mar. 20, 2006, at B1, available at <http://www.freepress.net/news/14506>.

operations with revenues from their Internet access, broadband, information, and data transmission services. Governor Tim Kaine signed both bills into law on March 10, 2006.<sup>150</sup>

Faced with these challenges and legislative activity, many local officials supported the Community Broadband Act of 2005 (S.1294), sponsored by Senators John McCain (R-Ariz.) and Frank Lautenberg (D-N.J.), which would protect local government authority to offer advanced communications services.<sup>151</sup> Similarly, a bill released by Democratic Congressman Bobby Rush (Ill.) and Committee Chairman Joe Barton (R-Texas), formally known as the Communications, Opportunity, Promotion and Enhancement (“COPE”) Act of 2006 (H.R. 5252) would prohibit any statute or regulation from prohibiting “any public provider of telecommunications service, information service, or cable service . . . from providing such services to any person or entity.”<sup>152</sup> It would also prohibit states or political subdivisions owning, controlling or affiliated with a public provider of telecommunications service, information service or cable service from granting “any preference or advantage to any such provider.”<sup>153</sup> It also requires non-discriminatory application of rules and ordinances to “any such [public] provider as compared to other providers of such services” and does not exempt such public provider “from any law or regulation that applies to providers of telecommunications service, information service, or cable service.”<sup>154</sup>

Under Senate Bill S. 2686—called the Communications, Consumer’s Choice, and Broadband Deployment Act—municipalities will have to provide thirty days notice before starting their own service and solicit private bids, but they are not required to accept those bids.<sup>155</sup> Similarly, a

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150. More legislative history on these bills is available at the following website: <http://leg1.state.va.us/cgi-bin/legp504.exe?ses=061&typ=bil&val=hb1404&Submit=Go>.

151. Community Broadband Act, S. 1294, 109th Cong. (2005). This bill was referred to the Committee on Commerce, Science, and Transportation on June 23, 2005, and it is in the first step of the legislative process as of the publication deadline for this Article.

152. H.R. 5252, 109th Cong. at 57–58 (2006). The House version of H.R. 5252 passed in the House and was referred to the Committee on Commerce, Science, and Transportation on June 29, 2006. H.R. 5252 also has much broader implications beyond municipal broadband, as it creates a process for granting a national franchise that would give a cable operator the authority to provide cable service in a franchise area. H.R. 5252 moved out of Committee without some heavily publicized net neutrality provisions. The Internet Freedom and Nondiscrimination Act goes much further, and would, among other things, make it unlawful for any network provider “to fail to provide its broadband network services on reasonable and nondiscriminatory terms and conditions . . .” H.R. 5417, 109th Cong. at 2 (2006).

153. H.R. 5252, 109th Cong. at 58 (2006).

154. *Id.*

155. Declan McCullagh, *Senate Moves to Ease Municipal Wi-Fi*, CNET NEWS.COM, June 29, 2006, [http://news.com.com/Senate+moves+to+ease+municipal+Wi-Fi/2100-7351\\_3-6089345.html](http://news.com.com/Senate+moves+to+ease+municipal+Wi-Fi/2100-7351_3-6089345.html). S. 2686 was introduced May 1, 2006, referred to the Committee on

bill that Senator John Ensign (R-Nev.) introduced would require state or local government to provide ninety days notice of the proposed scope of communications service to be provided, allow non-governmental entities to participate in an open bidding process, and give preference to a non-governmental entity in the event of a tie.<sup>156</sup> Even if a state or local government wins the bid, a non-governmental entity could place facilities in the same conduit, trenches, and locations as the state or local government for concurrent or future use under the same conditions secured by the state or local government.<sup>157</sup>

The Preserving Innovation in Telecom Act of 2005 (H.R. 2726) goes much further, as it would “prohibit municipal governments from offering telecommunications, information, or cable services except to remedy market failures by private enterprise to provide such services.”<sup>158</sup>

To promote funding of broadband deployment, The National Innovation Act of 2005 (S. 2109), which is garnering industry praise, would encourage federal agencies to devote three percent of their research and development budgets to grants for high-risk, innovative research and double the National Science Foundation’s research funding by fiscal year 2011.<sup>159</sup> Similarly, the goal of the proposed Internet and Universal Service Act of 2006 (S. 2256) is “to ensure the availability to all Americans of high-quality, advanced telecommunications and broadband services, technologies, and networks at just, reasonable, and affordable rates, and to establish a permanent mechanism to guarantee specific, sufficient, and predictable support for the preservation and advancement of universal service, and for other purposes.”<sup>160</sup> The Universal Service Reform Act of 2006 (H.R. 5072) that Representatives Terry (R-Neb.) and Boucher (D-Va.) introduced in late March 2006, would allow USF funds to pay for broadband services from contributions from service providers that use

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Commerce, Science, and Transportation on June 22, 2006, and is in the first step of the legislative process as of the publication deadline for this Article. S. 2686 would not eliminate local franchising but would subject it to federal forms and deadlines. S. 2686, 109th Cong. at 112–13, 115 (2005).

156. Broadband Investment and Consumer Choice Act, S. 1504, 109th Cong. § 15 (2005). This bill was introduced July 27, 2005, and it is in the first step in the legislative process as of the publication deadline for this Article.

157. *Id.* at § 15(d).

158. H.R. 2726, 109th Cong. (2005). H.R. 2726 was referred to the Committee on Finance on May 4, 2006, and it is in the first step of the legislative process as of the publication deadline for this Article.

159. Brian Hammond, *supra* note 6, at 5. See also S. 2109, 109th Cong. §§ 102–103 (2005). The bill was referred to the Committee on Finance on December 15, 2005, and it is in the first step of the legislative process as of the publication deadline for this Article.

160. S. 2256, 109th Cong. at 1 (2006). The bill was referred to the Committee on Commerce, Science, and Transportation on February 8, 2006, and it is in the first step of the legislative process as of the publication deadline for this Article.

telephone numbers, IP addresses, or offer network connections to the public.<sup>161</sup>

Other proposed federal legislation would allocate unused spectrum for broadband or other uses. A “white space” bill (H.R. 5085) introduced by Representatives Marsha Blackburn (R-Tenn.) and Jay Inslee (D-Wash.), would allow use of broadcast TV spectrum in the band between 54 and 698 MHz (other than 608–618 MHz) by unlicensed devices, including broadband services.<sup>162</sup> The Wireless Innovation Act of 2006 (S. 2327 or the “Winn Act”) would facilitate the development of wireless broadband Internet access by allocating the so-called “white spaces” between TV channels for other uses.<sup>163</sup> Similarly, the American Broadband for Communities Act (S. 2332) would allocate unused broadcast spectrum for unlicensed wireless devices and potentially provide communities with wireless broadband and home networking.<sup>164</sup>

Broadband, and specifically municipal broadband, is a dynamic topic that requires a national policy. Pending federal legislation is in various stages of the legislative process and, as of the publication deadline for this article, it is uncertain which, if any, of these bills will become law or how they will change as they progress through the legislative process.

### *C. Nixon v. Missouri Municipal League*

The United States Supreme Court in *Nixon v. Missouri Municipal League*<sup>165</sup> recently upheld a Missouri statute forbidding that state’s political subdivisions to provide or offer for sale a telecommunications service or facility.<sup>166</sup> The Court held that Section 253 of the

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161. Anne Veigle, *Terry-Boucher USF Bill: More Payers, Broadband Support*, COMM. DAILY, Apr. 3, 2006; H.R. 5072, 109th Cong. at 12–13 (2006). H.R. 5072 was referred to the Subcommittee on Telecommunications and the Internet on April 19, 2006, and it is in the first step of the legislative process as of the publication deadline for this Article.

162. American Broadband for Communities Act, H.R. 5085, 109th Cong. § 2 (2006). H.R. 5085 was also referred to the Subcommittee on Telecommunications and the Internet on April 19, 2006, and it is in the first step of the legislative process as of the publication deadline for this Article.

163. See S. 2327, 109th Cong. (2006). The bill was referred to the Committee on Commerce, Science, and Transportation on February 17, 2006, and it is in the first step of the legislative process as of the publication deadline for this Article.

164. S. 2332, 109th Cong. (2006). The bill was referred to the Committee on Commerce, Science, and Transportation on February 17, 2006, and it is in the first step of the legislative process as of the publication deadline for this Article.

165. *Nixon v. Mo. Mun. League*, 541 U.S. 125 (2004).

166. Section 392.410(7) of Missouri’s Revised Statutes provides that “[n]o political subdivision of this state shall provide or offer for sale, either to the public or to a telecommunications provider, a telecommunications service or telecommunications facility used to provide a telecommunications service for which a certificate of service authority is required pursuant to this section.” MO. ANN. STAT. § 392.410(7) (West Supp. 2006). The



Telecommunications Act of 1996 ("1996 Act"), which prohibits state or local statutes or regulations prohibiting the ability of any entity to provide telecommunications services,<sup>167</sup> did not include a state's own subdivision in the definition of "any entity."<sup>168</sup> That is, the Court held that "[t]he class of entities contemplated by § 253 does not include the State's own subdivisions, so as to affect the power of States and localities to restrict their own (or their political inferiors') delivery of telecommunications services."<sup>169</sup> By reversing the decision of the United States Court of Appeals for the Eighth Circuit, the Court effectively upheld the FCC's refusal to declare the Missouri statute preempted.<sup>170</sup>

The Court reasoned that applying Section 253 to a governmental unit would essentially lead to absurd or futile results:

In sum, § 253 would not work like a normal preemptive statute if it applied to a governmental unit. It would often accomplish nothing, it would treat States differently depending on the formal structures of their laws authorizing municipalities to function, and it would hold out no promise of a national consistency. We think it farfetched that Congress meant § 253 to start down such a road in the absence of any clearer signal than the phrase "ability of any entity. See, e.g., *United States v. American Trucking Assns., Inc.* 310 U.S. 534, 543, (1940) (Court will not construe a statute in a manner that leads to absurd or futile results)."<sup>171</sup>

The Court went on to invoke its "working assumption that federal legislation threatening to trench on the States' arrangements for conducting their own governments should be treated with great skepticism, and read in a way that preserves a State's chosen disposition of its own power, in the absence of the plain statement *Gregory* requires."<sup>172</sup>

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Court observed at n.1 that "[t]he provision is subject to some exceptions not pertinent here." *Nixon*, 541 U.S. at 129 n.1.

167. 47 U.S.C. § 253(a) (2000).

168. *Nixon*, 541 U.S. at 141.

169. *Id.* at 125 (syllabus). See also *Time Warner Telecom of Oregon, LLC, v. City of Portland*, No. CV 04-1393-PA at 15-16 (D. Or. Mar. 8, 2006), available at <http://www.portlandonline.com/shared/cfm/image.cfm?id=128459>, where U.S. District Court Judge Panner held that Section 253(a) does not apply to Oregon's Integrated Regional Network Enterprise (IRNE), which provides voice and Ethernet high-speed data transmission services, after finding that the plaintiffs failed to show that IRNE regulates or imposes legal requirements on them.

170. See *Mo. Mun. League, Memorandum Opinion and Order*, 16 F.C.C.R. 1157, para. 9 (2001) (concluding that "the term 'any entity' in section 253(a) . . . was not intended to include political subdivisions of the state, but rather appears to prohibit restrictions on market entry that apply to independent entities subject to state regulation.").

171. *Nixon*, 541 U.S. at 138.

172. *Id.* at 140. The Court in *Nixon* noted that "the FCC also adverted to the principle of *Gregory v. Ashcroft*, 501 U.S. 452 (1991), that Congress needs to be clear before it constrains traditional state authority to order its government. 16 FCC Rcd., at 1169." *Id.* at 130.

Justices Scalia and Thomas concurred in the Court's judgment, but they would have reversed the Court of Appeals because "Section 253(a) simply does not provide the clear statement which would be required by *Gregory v. Ashcroft* . . . , for a statute to limit the power of States to restrict the delivery of telecommunications services by their political subdivisions."<sup>173</sup> They did not believe that avoiding "unhappy consequences is adequate basis for interpreting a text."<sup>174</sup>

This author concurs with Justices Scalia and Thomas that avoiding unhappy consequences is not an appropriate basis for interpreting a statute.<sup>175</sup> Consequences mean different things to different people, depending upon the circumstances and where those people stand on a particular issue. The Court could have simply decided the matter based on strict construction of Section 253(a) and the Missouri statute without venturing into the subjective debate of unhappy consequences.

Justice Stevens also raised a valid point in his dissenting opinion that "there is every reason to suppose that Congress meant precisely what it said: No State or local law shall prohibit or have the effect of prohibiting the ability of *any* entity, public or private, from entering the telecommunications market."<sup>176</sup> He concluded that the legislative history of Section 253<sup>177</sup> "clearly meant for § 253 to preempt 'explicit prohibitions on entry by a utility into telecommunications.'"<sup>178</sup>

What is the impact of *Nixon*? *Nixon* is a very pro-states' rights decision. After *Nixon*, states have wide latitude to pass legislation pertaining to municipalities' provision of telecommunications services.<sup>179</sup> One would expect more legislation addressing municipality-provided telecommunications services given the Court's interpretation in *Nixon* that "any entity" in Section 253(a) does not include a state's own subdivisions. This is not to say that states have an unrestricted right to restrict or limit municipal telecommunications entry given the anti-discrimination provisions of the Act and several state codes, and the "competitively neutral" requirements of Section 253(b)<sup>180</sup> of the Act. Given the increased

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173. *Id.* at 141.

174. *Id.*

175. *See id.*

176. *Id.* at 144 (Stevens, J., dissenting).

177. S. Rep. No. 104-230, at 127 (1996) (Conf. Rep.).

178. 541 U.S. at 143 (Stevens, J., dissenting).

179. The FCC has, however, preempted state regulation of IP-enabled services that have the same characteristics as Vonage's IP-based service, including requiring a broadband connection, IP-compatible CPE, and integrated capabilities and features that allow customers to manage personal communications dynamically. *See Vonage Holdings Corp., Memorandum Opinion and Order*, 19 F.C.C.R. 22404, para. 47 (2004).

180. 47 U.S.C. § 253(b) (2000) provides: "State Regulatory Authority—Nothing in this section shall affect the ability of a State to impose, on a competitively neutral basis and

potential of a patchwork of varying state municipal broadband laws across the country after *Nixon* and the challenges they may present to national product deployment and marketing plans, there is an increased need for federal legislation addressing municipal broadband deployment and the terms under which it is available to the public.

## VI. LEVEL PLAYING FIELD AND TECHNICAL ISSUES

Using tax dollars and public facilities to build and fund municipal broadband projects raises several level playing field issues. Local telephone companies, competitive local exchange companies, and cable companies predictably oppose government-subsidized municipal broadband operations that compete with their own broadband services. For example, in response to the District of Columbia's wireless Internet proposal, an RCN representative expressed concern about the government using tax dollars and public facilities to subsidize a commercial enterprise that competes with private business.<sup>181</sup>

Similarly, Time Warner and Qwest recently argued that the City of Portland has unfair competitive advantages over private carriers, such as the ability to enter into intergovernmental agreements to share resources with other governments, control over access to public rights of way, and grant franchises.<sup>182</sup> Judge Panner agreed with the plaintiffs "that a local government may face a conflict of interest when it competes with private carriers in the market for telecommunications services," but he found no such evidence in that case.<sup>183</sup>

Sprint challenged BVU's OptiNet network by filing a petition, request for declaratory judgment, and request for injunctive relief due to alleged violations of various Virginia code sections prohibiting the City of Bristol from providing telecommunications services to the public until it complied with certain competitive safeguard requirements. Among other things, Sprint argued that the "City of Bristol has a duty to prevent cross subsidies in any of its telecommunications services from any source not expressly approved by the Commission."<sup>184</sup> Although the Commission denied

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consistent with section 254 of this title, requirements necessary to preserve and advance universal service, protect the public safety and welfare, ensure the continued quality of telecommunications services, and safeguard the rights of consumers."

181. Mohammed, *supra* note 78, at D5.

182. Time Warner Telecom of Oregon, *supra* note 169, at 18.

183. Time Warner Telecom of Oregon, *supra* note 169, at 18.

184. Brief of United Telephone-Southeast, Inc. at 12, Petition of United Telephone-Southeast, Inc. for Declaratory Judgment, No. PUC-2002-00231 (Va. Corp. Comm'n July 12, 2004) available at <http://docket.scc.virginia.gov:8080/vaproduct/main.asp> (click on "Search Documents" link, type the docket number into search engine, and select link for document titled "United Telephone-Southeast Inc. (Sprint) – Brief (Confidential Version

Sprint's Petition, it did find that BVU's internal rate of return on equity "is below the 11% imputed above, which is an indication that Bristol is not covering the incremental costs of, and not earning its cost of capital on, the jointly-provided telephone, data, and cable television services offered via OptiNet" and that "there is an increased possibility that Bristol's telephone services may be subsidized."<sup>185</sup>

To avoid such debates and challenges, some cities are "awarding contracts to firms that build the networks at their own expense, pay taxes or franchise fees, and operate autonomously, in return for special rights to city-owned facilities such as utility poles, towers, building tops and electricity."<sup>186</sup>

Industry partnerships have long provided opportunities for sharing resources, skills, expertise, and revenues while reducing risk. For example, Sprint Nextel's partnerships with cable companies to create new converged mobile technologies generated \$100 million in revenue for Sprint Nextel in 2005, with a forecast of \$1 billion by 2009.<sup>187</sup> More than one million customers use Sprint Nextel/cable company-provided VoIP services.<sup>188</sup> In Canada, Rogers Communications, a cable operator, and Bell Canada, its telecom rival, compete and collaborate on a quadruple play of bundled services, including broadband.<sup>189</sup> Similarly, public/private partnerships such as the Wireless Philadelphia project offer the opportunity for businesses to offer their expertise in providing broadband service and operational support while gaining access to critical city rights-of-way, spreading the risk among several partners, and providing revenue opportunities for such partners.

Others worry that citywide Wi-Fi networks will interfere with existing Wi-Fi systems and will be built using proprietary technologies so that municipalities will become dependent on their equipment-makers.<sup>190</sup> Again, Wi-Fi also operates in "unlicensed" frequency bands, which should be available for anyone to use.<sup>191</sup> Some worry that municipal networks interfere with existing Wi-Fi networks and in effect appropriate a shared

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185. Petition of United Telephone-Southeast, Inc. for Declaratory Judgment, *Final Order*, No. PUC-2002-00231, 2005 Va. PUC LEXIS 106 (Va. Corp. Comm'n Feb. 25, 2005), available at <http://docket.scc.virginia.gov:8080/vaprod/main.asp> (click on "Search Documents" link, type the docket number into search engine, and select link for document titled "United Telephone-Southeast, Inc. – Final Order – 2/25/05.").

186. *Wi-Pie in the Sky?*, *supra* note 107, at 23.

187. Anderson, *supra* note 41.

188. *Sprint Nextel's VoIP Customers Pass 1 Million Mark*, KANSAS CITY BUS. J., Apr.10, 2006 (on file with the *Federal Communications Law Journal*).

189. van Duyn & Taylor, *supra* note 88.

190. *Wi-Pie in the Sky?*, *supra* note 107, at 22.

191. *Wi-Pie in the Sky?*, *supra* note 107, at 23.

public asset, while municipal broadband proponents argue that such technology does not cause interference given the millions of access points in use already.<sup>192</sup>

"Another problem . . . is that there is no common standard for Wi-Fi meshing, and thus no compatibility between the five leading vendors' equipment."<sup>193</sup> A Wi-Fi mesh infrastructure is formed when a collection of 802.11a, b, or g-based nodes are interconnected by wireless 802.11 links.<sup>194</sup> A Wi-Fi meshing standard, called 802.11, is under development but it is not very far along, and cities want to build now.<sup>195</sup> Wi-Fi mesh networks are driving WiMAX demand by increasing wireless access proliferation, increasing the need for cost-effective backhaul solutions, and increasing the need for faster last-mile performance.<sup>196</sup> Wi-Fi mesh infrastructures are based on proprietary solutions that may support VoIP and quality of service ("QoS"), while increasing performance from Wi-Fi's 54-Mbps limit to over 100 Mbps.<sup>197</sup> "These implementations, however, are not interoperable, have limited scalability, and in certain deployments are limited by wired backhaul."<sup>198</sup> As illustrated in Figure 1, a Wi-Fi mesh-network offers mobility while WiMAX offers a long-distance backhaul and last-mile solution.<sup>199</sup> According to Intel, the best solution is a combination of these two technologies.<sup>200</sup>

Most municipal networks will be based on a Wi-Fi standard that is already more than three years old, rather than the next-generation, faster 802.11n standard.<sup>201</sup> While waiting a year or two might produce faster networks over greater areas at lower cost,<sup>202</sup> this will always be the case given the fast pace of this new technology. This suggests the need for

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192. *Wi-Pie in the Sky?*, *supra* note 107, at 23–24.

193. *Wi-Pie in the Sky?*, *supra* note 107, at 24.

194. UNDERSTANDING WI-FI AND WiMAX AS METRO-ACCESS SOLUTIONS, *supra* note 33, at 7.

195. UNDERSTANDING WI-FI AND WiMAX AS METRO-ACCESS SOLUTIONS, *supra* note 33, at 7.

196. UNDERSTANDING WI-FI AND WiMAX AS METRO-ACCESS SOLUTIONS, *supra* note 33, at 12.

197. UNDERSTANDING WI-FI AND WiMAX AS METRO-ACCESS SOLUTIONS, *supra* note 33, at 7.

198. UNDERSTANDING WI-FI AND WiMAX AS METRO-ACCESS SOLUTIONS, *supra* note 33, at 7.

199. UNDERSTANDING WI-FI AND WiMAX AS METRO-ACCESS SOLUTIONS, *supra* note 33, at 12.

200. UNDERSTANDING WI-FI AND WiMAX AS METRO-ACCESS SOLUTIONS, *supra* note 33, at 12.

201. UNDERSTANDING WI-FI AND WiMAX AS METRO-ACCESS SOLUTIONS, *supra* note 33, at 12.

202. UNDERSTANDING WI-FI AND WiMAX AS METRO-ACCESS SOLUTIONS, *supra* note 33, at 12.

flexible business models that are adaptable to rapidly changing technology.

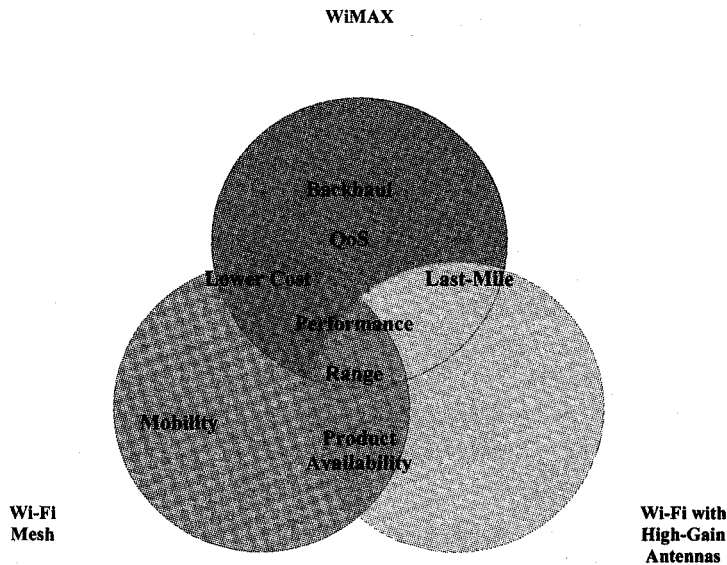


Figure 1: WiMAX and Wi-Fi metro-access solution features.

Source: UNDERSTANDING WI-FI AND WiMAX AS METRO-ACCESS SOLUTIONS, *supra* note 33, at 12 (with permission).

## VII. MUNICIPAL BROADBAND REGULATORY REQUIREMENTS

Streamlined rules and regulations promoting broadband deployment are critical to bridging the digital divide. The Internet and wireless telecommunications have flourished with minimal regulation, and they serve as a model for fostering broadband deployment of other technologies and applications. Competition is the best regulator as demonstrated by the massive price reductions and proliferation of service features in the toll interexchange market over the last twenty years and fierce wireless competition. Outdated regulations that no longer reflect market realities or current technology should be streamlined consistent with the level of competition, particularly where there is viable competition among three or more facilities-based providers of comparable services in the same market.

As a general matter, in competitive markets broadband entry rules and those governing existing broadband service providers should be relaxed to facilitate nationwide deployment of broadband. A patchwork of broadband entry and service provision rules complicates nationwide and worldwide broadband deployment plans.

The FCC has taken some important steps in deregulating high-volume data lines. Acting in the wake of the Supreme Court's *Brand X* decision,<sup>203</sup> the FCC recently determined that wireline broadband Internet access ("DSL") services are information services and not subject to Title II regulation.<sup>204</sup> The FCC concluded that wireline broadband Internet access service providers that offer that transmission as a telecommunications service "may do so on a permissive detariffing basis."<sup>205</sup> That is, such providers may include rates, terms, and conditions of their generally available offerings on their Websites in lieu of filing tariffs.<sup>206</sup> This provides flexibility in how incumbent local exchange companies offer the transmission component of their DSL service to affiliated or unaffiliated ISPs, and it places wireline Internet access on more of an equal regulatory footing with cable modem service.

The FCC recently extended its deregulatory approach for Verizon's broadband services by granting Verizon's petition by operation of law.<sup>207</sup> "In December 2004, [Verizon] asked the FCC to ease rules on data lines used by its enterprise customers, freeing it from common-carrier obligations," including access at just and reasonable rates.<sup>208</sup> Comptel and Sprint Nextel challenged the FCC's action in federal court, with no ruling as of the publication deadline for this Article.

The FCC's deregulatory approach for high-speed data lines is considerably different than the approach in France, where regulators in 2000 required "France Telecom SA to make its national network of phone lines available to other providers of phone and Internet services."<sup>209</sup> One French company, Iliad, has benefited from this regulatory approach by

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203. *Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs.*, 545 U.S. 967 (2005).

204. Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, *Report and Order*, 20 F.C.C.R. 14853, para. 12 (2005).

205. *Id.* at para. 90.

206. *Id.*

207. Press Release, FCC, Verizon Telephone Companies' Petition for Forbearance from Title II and Computer Inquiry Rules with Respect to their Broadband Services is Granted by Operation of Law (March 20, 2006), available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-264436A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-264436A1.pdf); Amy Schatz, *FCC Deregulates Verizon's Big-Business Market*, WALL ST. J., Mar. 21, 2006, at A3; *Verizon Telephone Companies' Petition for Forbearance Under 47 U.S.C. §160(c) with Regard to Broadband Services Provided via Fiber to the Premises*, Order, DA 05-394, WC Docket No. 04-242, 20 F.C.C.R.2529 (2005).

208. Schatz, *supra* note 207. It will be interesting to see what impact AT&T's and BellSouth's proposed merger condition not to "seek a ruling . . . altering the status of any facility being currently offered as a loop or transport UNE under section 251(c)(3) of the Act" has on other companies' comparable offerings. See Letter from Robert W. Quinn, Jr., Senior VP Federal Regulatory for AT&T, to Kevin Martin, Chairman, FCC (Oct. 13, 2006), WC Docket No. 06-74.

209. Leila Abboud, *How France Became A Leader in Offering Faster Broadband*, WALL ST. J., Mar. 28, 2006, at B1.

offering over 1.1 million French subscribers a triple play package called “Free” that includes eighty-one TV channels, unlimited phone calls within France and to fourteen countries, and high-speed Internet for \$36 per month.<sup>210</sup>

Germany is facing similar regulatory issues. German regulators must decide whether Deutsche Telekom, which is investing €3 billion to connect residential customers to the Internet at speeds of up to 50 Mbps, must allow rivals to piggyback on the new broadband service.<sup>211</sup> Executives of Spain’s Telefonica SA, which plans to spend €4 billion to upgrade its network to offer high-speed Internet access at 50 Mbps for 60% of Spain’s households by 2010, have also called for a freer regulatory hand.<sup>212</sup>

Japan has encouraged broadband deployment by “open access” to residential phone lines, so that competitors pay the same wholesale price to use the wires, together with economic incentives like tax breaks, debt guarantees, and subsidies.<sup>213</sup>

An FCC task force has recommended certain actions to speed the rollout of wireless broadband services to consumers across America. These actions include ensuring that FCC rules are flexible enough to allow providers to pair spectrum asymmetrically to account for the unbalanced nature of broadband services. This typically requires a large amount of bandwidth downstream and applying a pro competitive innovative national framework for wireless broadband services that imposes few federal or state regulatory barriers.<sup>214</sup> These and other solutions are necessary to promote responsible broadband deployment given the difficulty of deploying national broadband business plans amidst a patchwork of different rules and regulations.

The FCC recently expanded the base of Universal Service Fund (“USF”) contributions by extending universal service contribution obligations to providers of interconnected VoIP service. For interconnected VoIP providers, the Commission established a safe harbor percentage of interstate revenue at 64.9 percent of total VoIP service revenue.<sup>215</sup> The FCC

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210. *Id.*

211. Mike Esterl, *Politics & Economics: Deutsche Telekom Is Stirring Up the EU*, WALL ST. J., Mar. 25, 2006, at A4.

212. *Id.*

213. McChesney & Podesta, *supra* note 7, at 14–15.

214. Press Release, FCC, FCC Task Force Recommends Action to Speed the Rollout of Wireless Broadband Services to Consumers Across America (Feb. 10, 2005), *available at* [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-256694A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-256694A1.pdf). The FCC also will examine whether broadband services can be used in the 700 MHz public-safety band. FCC, REPORT TO CONGRESS ON THE STUDY TO ASSESS SHORT-TERM AND LONG-TERM NEEDS FOR ALLOCATIONS OF ADDITIONAL PORTIONS OF THE ELECTROMAGNETIC SPECTRUM, 37 Comm. Reg. (P & F) 706, para. 100 (2005).

215. Press Release, FCC, FCC Updates Approach for Assessing Contributions to the



also raised the existing wireless “safe harbor” percentage used to estimate interstate revenue from 28.5 percent to 37.1 percent of total end-user telecommunications revenue to better reflect growing demand for wireless services.”<sup>216</sup> That is, the FCC now assumes that 64.9 percent of all interconnected VoIP calls and 37.1 percent of all wireless calls are subject to interstate USF charges unless demonstrated otherwise.<sup>217</sup>

Given the FCC’s broader source of universal service funding, expanding the USF to cover broadband service needs might also facilitate broadband deployment and availability. Such thorny issues as USF eligibility, distribution, and availability of funds for various types of broadband providers would need to be addressed.

In light of the issues noted above in this section, national legislation is clearly necessary to level the playing field between municipalities and non-municipalities offering broadband services to the public. Requiring municipalities to solicit private bids and select the lowest bidder before they build a municipal broadband system in the absence of no bids or no existing broadband service in the relevant market is one option. Prohibiting municipalities from obtaining or using artificial advantages or preferences not available to other broadband providers through national legislation would also help level the playing field. Variations of these alternatives are pending before Congress as of the publication deadline for this Article, though their passage in the 109th Congress appears unlikely.

As noted above, partnering arrangements following a competitive bidding process would also help to neutralize level-playing field and regulatory concerns. Government grant monies could be made available to fund such broadband deployment partnerships.

Although competition is preferable to regulation in a competitive market, regulation may be necessary to promote competition and neutralize municipalities’ advantages where they have market power or where they enjoy government or quasi-governmental status in providing broadband services that are not available to other broadband providers. That is, in some instances it may be necessary for regulators to ensure that municipalities do not have an unfair advantage in offering broadband and

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Federal Universal Service Fund (June 21, 2006), available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-266030A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-266030A1.pdf) [hereinafter FCC Updates Approach]; Universal Service Contribution Methodology, *Report and Order*, 38 Comm. Reg. (P & F) 1013, para. 53 (2006) [hereinafter *Universal Service Report and Order*].

216. FCC Updates Approach, *supra* note 215; *Universal Service Report and Order*, *supra* note 215, at para. 2.

217. Interconnected VoIP providers and wireless carriers also may calculate their interstate revenues based on their actual revenues or by using traffic studies. See *Universal Service Report and Order*, *supra* note 215, at paras. 52, 66.

other services. Municipalities providing high-speed Internet, telephone, video, and utility services to the public should be subject to the same reporting requirements and rules prohibiting cross-subsidies and below-cost pricing that apply to regulated non municipal entities providing similar services. Financial reporting, cost justification, cost imputation, price imputation, price floors and caps, royalty imputation, affiliate transaction reporting, tariffs, and other rules and regulations applicable to such regulated entities should also apply to municipalities providing similar services to the public.

Municipalities that provide broadband services to the public and control access to rights-of-way, pole attachments, conduits, antennas, franchises, and other critical inputs should reflect or impute the costs of those inputs in the pricing of their services based on the market value of those inputs to counter any artificial pricing advantages.<sup>218</sup> Similarly, favorable financing terms available to municipalities providing broadband access should be equally available to all broadband service providers on similar terms to level the financial playing field.

Utah has addressed these issues through legislation that requires a municipality that provides cable television service or public telecommunications services to establish an enterprise fund to account for the municipalities' cable or public telecommunications operations, with separate operating and capital budgets for such services.<sup>219</sup> The Utah Municipal Code also requires a municipality that provides a cable television service to comply with the Cable Communications Policy Act of 1984 and the FCC's cable regulations, while municipalities offering public telecommunications services must comply with the 1996 Act and the FCC's telecommunications regulations, and interconnection requirements.<sup>220</sup> Moreover, a Utah municipality may not cross-subsidize its cable television services or its public telecommunications services with tax dollars, income from other municipal or utility services, below-market rate loans from the municipality, or any other means.<sup>221</sup> Utah municipalities are also precluded from granting any undue or unreasonable preference or advantage to themselves or to any private provider of cable television or public telecommunications services,<sup>222</sup> and they must include in their rates all taxes, fees, and other assessments that a similarly situated provider of

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218. See generally 47 C.F.R. § 1.1416; Craig Dingwall, *Imputation of Access Charges—A Prerequisite for Effective IntraLATA Toll Competition*, 40 ADMIN. L. REV. 433 (1988).

219. UTAH CODE ANN. § 10-18-301(1) (2003).

220. *Id.* § 10-18-303(1), (2).

221. *Id.* § 10-18-303(3).

222. *Id.* § 10-18-303(4)(a).

the same services would pay.<sup>223</sup> They may not price cable or public telecommunications services below the actual direct or indirect costs of providing such services.<sup>224</sup>

Washington requires a public utility district providing wholesale telecommunications services to ensure that its rates are not unduly discriminatory or preferential and that all telecommunications services rendered to the district are allocated at full value.<sup>225</sup>

In some situations, structural separation of regulated and unregulated operations or divestiture of unregulated assets may be necessary to prevent "self-dealing issues, the exercise of market power, and other potential abuses that may arise when competitive operations are affiliated with rate-regulated utility monopolies."<sup>226</sup> Based in part on this principle, the NYPSC tentatively concluded that "electric utilities should not directly provide BPL services to the public. Rather, they should explore ways of granting unaffiliated BPL providers appropriate access to the electric system at market determined prices."<sup>227</sup> Under the New York State Department of Public Service Staff's recommended guidelines, regulated electric utilities may operate BPL communications systems through a structurally separated utility affiliate, subject to "acceptable cost allocation, affiliate transactions, and related business rules."<sup>228</sup> BPL providers must also pay a fee for electric system access, with usage rates based on market rates.<sup>229</sup>

## VIII. TELECOM ACT REWRITE?

There have been significant technological changes since the 1996 Act was enacted more than ten years ago. VoIP, growth in wireless services, and broadband proliferation are just some of the many developments that have occurred in the aftermath of the 1996 Act. The timing and extent of any rewrite of the 1996 Act is the subject of considerable debate. Any rewrite of the 1996 Act should include incentives to promote responsible broadband deployment.

While federal legislation is clearly necessary to avoid inconsistent municipal entry laws, a patchwork of state laws and the unlikely timely passage of relevant federal legislation underscore the need for national

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223. *Id.* § 10-18-303(5)(a).

224. *Id.* § 10-18-303(5)(b).

225. WASH. REV. CODE ANN. § 54.16.330(2), (4) (West 2004).

226. Deployment of Broadband, *supra* note 50, at 3.

227. Deployment of Broadband, *supra* note 50, at 3.

228. New York PSC BPL Policy Supports Deployment, TR Daily, Oct. 18, 2006, (on file with *Federal Communications Law Journal*); N.Y. PSC Gives Utility BPL Short-Term 'Flexibility', COMM. DAILY, Oct. 20, 2006, at 2.

229. *Id.*

policy that also addresses the level playing field issues noted above.

A national policy should encourage responsible broadband deployment by addressing several key points, including:

- Assessing broadband demand and whether it is being met, as well as evaluating broadband deployment costs before municipalities offer broadband service to the public and other non-municipal entities;
- Municipality-solicited private bids and lowest bidder selection before building a municipal broadband system in the absence of no bids or no existing broadband service in the relevant market;
- Streamlining rules and regulations while ensuring that municipalities and other broadband service providers operate on a level playing field;
- Offering incentives for broadband deployment, including accelerated depreciation, grants, and tax credits/deductions for new broadband facilities;
- Making more spectrum available for broadband deployment and eliminating unnecessary use and eligibility restrictions on spectrum;<sup>230</sup>
- Addressing interference concerns between licensed and unlicensed spectrum;
- Eliminating outdated rules that discourage network convergence; and
- Identifying a common standard for wireless broadband deployment, including Wi-Fi meshing.

## IX. CONCLUSION

Broadband deployment is critical to bridging the digital divide between urban and rural areas and fostering education, growth, social, economic, and financial development. Where the need for broadband is not being met, municipalities can help to foster broadband deployment through an efficient use of their resources on a level regulatory playing field. Given the competitive, pricing, and technology risks associated with broadband deployment, government/industry partnerships following a competitive bidding process offer perhaps the best solution for municipal broadband deployment. This approach uses the particular skills and assets of municipalities and private entities while reducing risks for the partners and helping to minimize overbuilding of facilities and overcapacity. Regardless of the business model, a national municipal broadband deployment policy

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230. See generally Hundt & Rosston, *supra* note 7.

is critical to promote responsible broadband deployment in the United States.